

STACK EMISSIONS MONITORING



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Operator & Address:

Viridor Waste Management Ltd
Cardiff Energy from Waste Facility
Glass Avenue
Ocean Way
Cardiff

Permit Reference:


EPR Permit: EPR/LP3030XA

Release Point:

A1 - Stream 1

Sampling Date(s):

13th - 16th November 2018

SOCOTEC UK Job Number:	LSO 181117 / Biannual 2
Report Date:	01st February 2019
Version:	1
Report By:	Jonathan Ward
MCERTS Number:	MM 02 080
MCERTS Level:	MCERTS Level 2 - Team Leader
Technical Endorsements:	1, 2, 3 & 4
Report Approved By:	David May
MCERTS Number:	MM 07 862
Business Title:	MCERTS Level 2 - Operations Manager (LSO)
Technical Endorsements:	1, 2, 3 & 4
Signature:	



1015



EXECUTIVE SUMMARY

EMISSIONS SUMMARY					
Parameter	Units	Result	Calculated Uncertainty +/-	Limit	MCERTS accredited result
Dioxins & Furans - UPPER Limits					
Dioxins & Furans (NATO I-TEQ)	ng/m ³	0.0436	0.0046	0.1	✓
Dioxins & Furans (NATO I-TEQ) Emission Rate	µg/hr	7.0522	0.7405	-	✓
Dioxins & Furans (WHO TEQ Humans / Mammals)	ng/m ³	0.0408	0.0043	-	✓
Dioxins & Furans (WHO TEQ H / M) Emission Rate	µg/hr	6.6079	0.6938	-	✓
Dioxins & Furans (WHO TEQ Fish)	ng/m ³	0.0415	0.0044	-	✓
Dioxins & Furans (WHO TEQ Fish) Emission Rate	µg/hr	6.7192	0.7055	-	✓
Dioxins & Furans (WHO TEQ Birds)	ng/m ³	0.0639	0.0067	-	✓
Dioxins & Furans (WHO TEQ Birds) Emission Rate	µg/hr	10.3375	1.0854	-	✓
Dioxins & Furans - LOWER Limits					
Dioxins & Furans (NATO I-TEQ)	ng/m ³	0.0436	0.0046	-	✓
Dioxins & Furans (NATO I-TEQ) Emission Rate	µg/hr	7.0522	0.7405	-	✓
Dioxins & Furans (WHO TEQ Humans / Mammals)	ng/m ³	0.0408	0.0043	-	✓
Dioxins & Furans (WHO TEQ H / M) Emission Rate	µg/hr	6.6079	0.6938	-	✓
Dioxins & Furans (WHO TEQ Fish)	ng/m ³	0.0415	0.0044	-	✓
Dioxins & Furans (WHO TEQ Fish) Emission Rate	µg/hr	6.7192	0.7055	-	✓
Dioxins & Furans (WHO TEQ Birds)	ng/m ³	0.0639	0.0067	-	✓
Dioxins & Furans (WHO TEQ Birds) Emission Rate	µg/hr	10.3375	1.0854	-	✓
Dioxin-like PCBs - UPPER Limits					
Dioxin-like PCBs (WHO TEQ Humans / Mammals)	ng/m ³	0.0030	0.0003	-	✓
Dioxin-like PCBs (WHO TEQ H / M) Emission Rate	µg/hr	0.4849	0.0548	-	✓
Dioxin-like PCBs (WHO TEQ Fish)	ng/m ³	0.0003	0.0000	-	✓
Dioxin-like PCBs (WHO TEQ Fish) Emission Rate	µg/hr	0.0433	0.0049	-	✓
Dioxin-like PCBs (WHO TEQ Birds)	ng/m ³	0.0075	0.0008	-	✓
Dioxin-like PCBs (WHO TEQ Birds) Emission Rate	µg/hr	1.2062	0.1363	-	✓
Dioxin-like PCBs - LOWER Limits					
Dioxin-like PCBs (WHO TEQ Humans / Mammals)	ng/m ³	0.0030	0.0003	-	✓
Dioxin-like PCBs (WHO TEQ H / M) Emission Rate	µg/hr	0.4849	0.0548	-	✓
Dioxin-like PCBs (WHO TEQ Fish)	ng/m ³	0.0003	0.0000	-	✓
Dioxin-like PCBs (WHO TEQ Fish) Emission Rate	µg/hr	0.0433	0.0049	-	✓
Dioxin-like PCBs (WHO TEQ Birds)	ng/m ³	0.0075	0.0008	-	✓
Dioxin-like PCBs (WHO TEQ Birds) Emission Rate	µg/hr	1.2062	0.1363	-	✓
PAHs	ug/m ³	1.01	0.73	-	✓
PAHs Emission Rate	g/hr	0.16	0.12	-	✓
Cadmium & Thallium	mg/m ³	0.0009	0.0006	0.05	✓
Cadmium & Thallium Emission Rate	g/hr	0.1490	0.0937	-	✓
Heavy Metals	mg/m ³	0.0262	0.0044	0.5	✓
Heavy Metals Emission Rate	g/hr	4.1557	0.6982	-	✓
Mercury	mg/m ³	0.0019	0.0005	0.05	✓
Mercury Emission Rate	g/hr	0.3034	0.0798	-	✓
Hydrogen Fluoride	mg/m ³	0.02	0.013	1	✓
Hydrogen Fluoride Emission Rate	g/hr	3.15	2.136	-	✓
Nitrous Oxide	mg/m ³	3.08	0.31	-	✓
Nitrous Oxide Emission Rate	g/hr	0.48	0.07	-	✓
Moisture	%	15.3	0.45	-	✓
Stack Gas Temperature	°C	159	-	-	✓
Stack Gas Velocity	m/s	25.6	0.62	-	
Gas Volumetric Flow Rate (Actual)	m ³ /hr	229306	11790	-	
Gas Volumetric Flow Rate (STP, Wet)	m ³ /hr	139983	7197	-	
Gas Volumetric Flow Rate (STP, Dry)	m ³ /hr	118532	6094	-	
Gas Volumetric Flow Rate at Reference Conditions	m ³ /hr	154741	7956	-	✓

ND = None Detected.

Results at or below the limit of detection are highlighted by bold italic text.

The above volumetric flow rate is calculated using data from the preliminary survey. Mass emissions for non isokinetic tests are calculated using these values. For all isokinetic testing the mass emission is calculated using test specific flow data and not the above values.

Reference conditions are 273K, 101.3kPa, dry gas 11% Oxygen.

APPENDIX 2 - Summaries, Calculations, Raw Data and Charts

PAHs SUMMARY					
Test	Sampling Times	Concentration ug/m ³	LOD ug/m ³	Limit ug/m ³	Emission Rate g/hr
Run 1	08:00 - 14:15 14 November 2018	1.0	0.15	-	0.159
Field Blank	-	1.00	-	-	-

Reference conditions are 273K, 101.3kPa, dry gas 11% Oxygen.

PAHs ANALYSIS SUMMARY RUN 1

Compound Name	LOD ug	Blank Result ug	Blank Result ug/m ³	Run 1 Result ug	Run 1 Result ug/m ³	Run 1 Uncertainties %
Anthranthrene	0.10	0.10	< 0.0091	0.10	< 0.0091	210.7
Benzo(a)anthracene	0.10	0.10	< 0.0091	0.10	< 0.0091	210.7
Benzo(b,j,k)fluoranthene	0.10	0.10	< 0.0091	0.10	< 0.0091	210.7
Benzo(b)napth(2,1-d)thiophene	0.10	0.10	< 0.0091	0.10	< 0.0091	210.7
Benzo(c)phenanthrene	0.10	0.10	< 0.0091	0.10	< 0.0091	210.7
Benzo(ghi)perylene	0.10	0.10	< 0.0091	0.10	< 0.0091	210.7
Benzo(a)pyrene	0.10	0.60	0.05	0.70	0.06	72.1
Chrysene	0.10	0.10	< 0.0091	0.10	< 0.0091	210.7
Cyclopenta(c,d)pyrene	0.10	0.10	< 0.0091	0.10	< 0.0091	210.7
Dibenzo(ah)anthracene	0.10	0.10	< 0.0091	0.10	< 0.0091	210.7
Dibenzo(a,i)pyrene	0.10	0.10	< 0.0091	0.10	< 0.0091	210.7
Fluoranthene	0.10	0.10	< 0.0091	0.10	< 0.0091	210.7
Indeno(1,2,3-cd)pyrene	0.10	0.10	< 0.0091	0.10	< 0.0091	210.7
Naphthalene	0.10	7.50	0.69	8.90	0.81	66.2
Acenaphthylene	0.10	0.10	< 0.0091	0.10	< 0.0091	210.7
Acenaphthene	0.10	1.50	0.14	0.10	< 0.0091	210.7
TOTAL PAHs	1.60	10.90	1.00	11.00	1.01	72.30
REPORTED PAHs (>= or equal to	-	-	-	-	1	

